ORIGINAL ARTICLE

IMPROVED AND EXPANDED PHARMACY CARE IN RURAL ALASKA THROUGH TELEPHARMACY AND ALTERNATIVE METHODS DEMONSTRATION PROJECT

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ABSTRACT

Objectives. To describe innovative use of technology to improve the level of pharmacy care in remote villages in rural Alaska.

Study design. Cross-sectional study.

Methods. The Alaska Native Medical Center and outlying health clinics formed the Southcentral Foundation Pharmacy Network to provide pharmacy services to Native and non-Native patients living in the rural Anchorage Service Unit. The Alaska Native Medical Center served as the central pharmacy, purchasing drugs on behalf of the network and dispensing those drugs to patients of the network. In April 2003, four remote pharmacies began a 6 month comparison of two different telepharmacy equipment systems. The systems were assessed for various factors such as hardware and software capabilities and the customer support offered. The program was then expanded to include 12 participating sites.

Results. During fiscal year 2006, 22665 prescriptions were processed utilizing telepharmacy and prospective pharmacist review. There were 990 documented pharmacist consultations and interventions (4.4% of all prescriptions processed).

Conclusions. Incorporation of recent technological advancements enabled the pharmacy department of the Alaska Native Medical Center to improve and expand the provision of pharmacy services to rural, isolated communities. Based upon the success of the program, future sites are being targeted for telepharmacy inclusion. *(Int J Circumpolar Health 2007; 66(Suppl 1):14-22).*

Keywords: telepharmacy, Alaska, automated dispensing machines, Community Health Aide Program, community health center

INTRODUCTION

Telepharmacy refers to the use of telecommunication to provide pharmacy services from a distance (1). In Alaska, access to both distributive and clinical pharmacy services is difficult for many patients and health care providers, particularly those residing in rural or geographically isolated locations. Pharmacy leaders are encouraging the integration of telecommunications in the provision of pharmaceutical care to continue the advancement of the profession (2). In 2003 Southcentral Foundation, an Alaska Native health corporation, initiated telepharmacy services to bridge the gap between the levels of pharmacy care provided to urban patients and their rural counterparts.

Pharmaceutical care access barriers in rural Alaska

Southcentral Foundation works to improve the health and well being of Alaska Native and American Indian people by developing and implementing comprehensive health-related services that meet changing needs, enhance culture, and empower individuals and families to take charge of their lives. Over 50 villages are included in the Anchorage Service Unit and served by Southcentral Foundation. The rural Anchorage Service Unit spans about 107,413 square miles in southcentral Alaska, a vast area in which few roads exist and transportation occurs by airplanes, ferries and snowmobiles (Fig. 1).

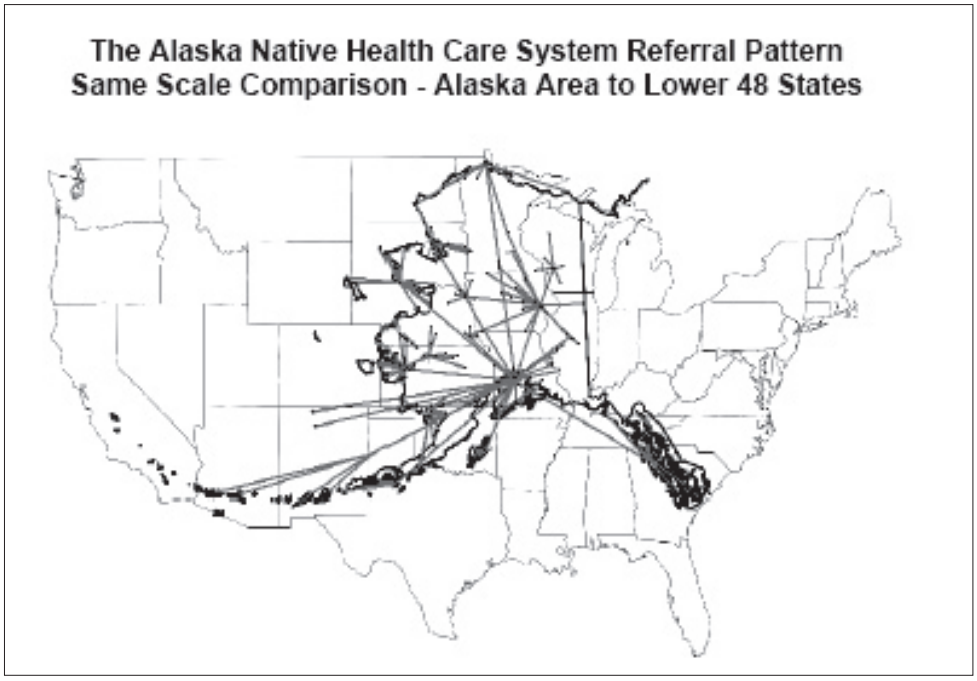

Figure 1. Indian Health Service. Alaska Area. www.alaska.ihs.gov/dpehs/pdf/ak-profile/area.pdf

The area includes 52 communities with a median population of 148 persons; less than half are connected to a road system. Those residing in the areas not accessible by road are isolated from health facilities by immense distances, climatic extremes and geographic barriers. Because of these challenges, it is difficult to provide medical services to the population of this area. Alaska Native and American Indian people residing within the Municipality of Anchorage are able to procure services from the Alaska Native Medical Center; however, people in rural communities suffer pharmacy access problems. Some patients living in the rural Anchorage Service Unit may elect to travel long distances from their rural village to the central pharmacy at the Alaska Native Medical Center, but the cost of travel is prohibitive for many. Consequently, overall medical costs may be elevated because patients may delay seeking health care until illnesses worsen. Telepharmacy can alleviate some of the difficulties of providing quality pharmacy care and benefit both the patient and the health care organization. For this reason, the Alaska Native Medical Center formed the Southcentral Foundation Telepharmacy Program to provide improved pharmacy services to Native and non-Native patients within participating sites of the rural Anchorage Service Unit.

Non-Native people, who are not beneficiaries of Indian Health Service facilities, were included because several of the towns and villages have significant transient and seasonal populations who travel to the area in search of jobs related to the fishing industry. This group is generally uninsured and the cost of purchasing medications is high. As the rural villages do not have retail pharmacies, these patients experience significant delays in medication delivery because it is dependent upon a cumbersome transportation situation.

Provision of pharmacy care before telepharmacy

Most of the rural villages have a means of providing health care within their respective village since travel limitations prevent centralizing resources. The isolated villages and towns generally do not have workload to justify full-time health care professional positions, including pharmacists, at their clinic sites. Provider shortages, housing, recruitment and staff turnover are additional obstacles to placing providers in these settings (Table I).

Table I. Population of telepharmacy sites and annual prescriptions

Village	Population	Annual prescriptions
Adak	48	502
Cold Bay	88	301
False Pass	64	120
King Cove	792	2383
McGrath	354	716
Nelson Lagoon	83	124
Nilavena	102	601
Sand Point	952	3309
Seldovia	286	1181
St. Paul	532	810
Wasilla	5700	11057
Whittier	182	1561
Total	9183	22665

In 1968, funding from the U.S. Congress was secured to develop the Community Health Aide Program as a means of providing primary care to people in the remote villages of Alaska (3). At the inception of this program, 185 community members were trained to provide basic medical care to people in 157 communities. Health aides are community members who do not need to meet a minimum educa-

tion requirement to participate in the training program. Their training is provided by culturally-aware physicians, nurse practitioners, physician's assistants and registered nurses who have experience providing medical care in rural Alaska. The program is composed of four 4-week sessions, each of which is separated by 200 hours of clinical practice in the field. Upon successful completion of the training program, the community health aide provides basic medical care to the people in the villages acting on standing orders and phone communication with physicians in hub communities such as Anchorage. Two reference tools have been developed for the Community Health Aide Program: the Alaska Community Health Aide/Practitioner Manual (4) and the Village Medication Reference (5). The community health aides follow these manuals to assess, diagnose and treat basic medical problems. Each community health aide routinely reports cases to a consulting medical provider. Today, over 600 community health aides provide health care to 50,000 people in 180 Alaskan communities utilizing the 4th edition of the *Community Health Aide Manual*.

The Alaska Native Medical Center has a village pharmacy department that coordinates chronic medication use for Alaska Native and American Indian people in the remote communities of Alaska. However, prior to implementation of telepharmacy, non-pharmacy personnel, including nurses, physicians, physician-extenders and community health aides, were responsible for maintaining pharmaceutical items needed to treat acute conditions and chronic medical conditions in the villages. Medications were ordered from the Alaska Native Medical Center or directly from a warehouse or manufacturer without a pharmacist review. With this system, medication accountability problems were prevalent, particularly when controlled substances were involved because of the added recordkeeping responsibilities. Wastage due to overstock and expired product was significant. Each clinic location was burdened by the administrative aspect of maintaining a dispensary area.

While this method of providing medications to patients in areas without a pharmacist was common, it was far from ideal and the lack of a pharmacist prescription review created disparities in levels of care. Furthermore, the Joint Commission on Accreditation of Health Care Organizations acknowledged that pharmacist inclusion in assuring appropriate medication regimens was important to prevent adverse drug events related to medication usage.

MATERIAL AND METHODS

Alternative Methods Demonstration Project

The Alternative Methods Demonstration Project was announced by the United States Department of Health and Human Services in June 2001. This project was aimed at reducing administrative costs associated with drug procurement and making medications more accessible to patients. In April 2003 Southcentral Foundation was approved to participate in the Health Resources and Services Administration's Alternative Methods Demonstration Project 340B Pricing Program to serve the newly established pharmacy network (6). The 340B pricing program is a program that allows covered clinics to purchase discounted medications, which can result in a savings of 25-40% on most drugs, for Indian Health Service non-

beneficiary patients seeking care within the pharmacy network. This network currently serves a total of 11 remote community health centers. Designating Alaska Native Medical Center pharmacy as the central pharmacy shifted administrative costs of 340B participation from the clinic sites to the central pharmacy and facilitated drug procurement, while affording the patient a reasonably priced option of receiving medications. Medication management of the village sites is now the responsibility of pharmacy services. Inventory management has improved as sites order formulary items through the pharmacy. The pharmacy ensures that records of procurement and distribution are maintained in accordance with governing rules and regulations.

Figure 2. Telepharmacy equipment installed at remote clinic site

Implementation of telepharmacy services

Perhaps more important than the procurement and cost of medication, safe and effective medication use is enhanced by the inclusion of a pharmacist in the patient's medical management team. Implementation of automated dispensing machines with videoconferencing abilities was employed to enhance pharmacy services to outlying clinic sites. The Telepharmacy Program was launched in the spring of 2003, beginning with a six month comparison between two existing systems, Telepharmacy Solutions® and PickPoint®, at 4 sites. The systems were evaluated by end users who assessed hardware and software use and adaptability, machine capacity, report capabilities, customer service and costs. PickPoint® was eventually selected as the preferred system (Fig. 2).

At the inception of the project, the projected workload from the 12 clinic sites dictated 1.5 full time pharmacists and 1.5 full time pharmacy technicians. Funding for this project was provided by a 2- year grant from the U.S. Health Resources and Services Administration to cover the costs of personnel, telepharmacy equipment, travel and indirect costs. The discounted 2003 cost of the PickPoint® equipment, including the automated dispensing machines, videoconferencing equipment and software was 41,615 US dollars per site. An additional 6390 US dollars covered the freight, installation, training and service agreement which brought the total to 48,005 US dollars.

Procurement, installation and training in the use of the telepharmacy equipment were completed for 12 sites, making this one of the largest telepharmacy networks in the United States. The pharmacist, along with

a representative from PickPoint® Corporation, was present during the equipment installation. To foster healthy working relationships, clinic personnel were introduced to the central telepharmacy staff during the installation. Communities were informed of this additional pharmacy service by posted flyers, announcements in local publications and general mailings. The Telepharmacy Project is currently available at Adak, Cold Bay, False Pass, King Cove, McGrath, Nelson Lagoon, Nilavena, Sandpoint, Seldovia, St.Paul, Wasilla, and Whittier. Adak, an island on the Eastern Aleutian chain located approximately 1,200 miles from Anchorage is the furthest outlying telepharmacy site. Providers receive orientation, training, and access to the automated dispensing machines through the central pharmacy.

Telepharmacy process

Commonly prescribed acute medications are provided using the automated dispensing machines. Standard medication lists are determined by the network pharmacy and the clinic's medical director to best reflect the needs of the population and encourage judicious use of more costly medications. The central pharmacy prepares two dimensional barcoded, prepackaged containers of each medication. The barcoded information includes the NDC number (a unique, 3-segment number that is a universal product identifier for medications), package size, lot number and expiration date. The medications are then shipped to the clinics where barcode scanners are used by designated clinic personnel to place the medications in the correct storage locations within the machine.

Prescription orders are sent by facsimile to the central pharmacy via a secure electronic system. Prior to issuing a medication to the patient, the patient's medication regimen is given a clinical evaluation by a pharmacist allowing the level of care to be commensurate to patients within the Municipality of Anchorage area. The pharmacists follow the U.S. Indian Health Service Pharmacy Standards of Practice (see Table II) and review the patient's medical record including laboratory data, past medical history, medication history, and other factors to evaluate the appropriateness of each prescription (7). Providers who prescribe medicines benefit from the ability to consult with the pharmacist for drug selection, dosing and related matters.

Pharmacists are enabled to better enforce drug usage guidelines to promote

Table II. Indian Health Service Pharmacy Standards of Practice.

Assure appropriateness of drug therapy
Verify that patients understand their medications and appropriate outcomes of their drug therapy
Assure availability, preparation and control of medications
Provide drug information, drug therapy consultation, and staff education relating to drug therapy
Manage therapy for selected patients in whom drugs are the principal method of treatment

Adapted from reference 7.

safe and effective medication use in the most cost-effective approach. Electronically transmitted prescriptions have been shown to be nearly 15% less expensive, probably due to the pharmacist's review (8). After the pharmacist determines the regimen to be safe and appropriate, the pharmacist enters the prescription into the patient's electronic medical record at the Alaska Native Medical Center. In the event of a patient transfer or admission, the medication list is more accurate and complete in accordance with a national patient safety goal set by the Joint Commission on Accreditation of Health Care Organizations regarding reconciliation of medication lists across the continuum of care. The medication is then queued for dispensing in the automated dispensing machine's software. Next, a barcoded prescription label is generated at the point-of-care. Authorized clinic personnel scan the barcodes on the prescription label to release the prescribed medication from the automated dispensing machine. As a final check, the barcode on the prepackaged drug container is also scanned to ensure the correct medication was loaded and consequently dropped. The provider then affixes the prescription label to the container before issuing the medication to the patient. Counseling and consultative services are provided by the pharmacist at the central pharmacy using videoconferencing equipment or via telephone. Patient educational materials are printed at the clinic site by the pharmacist.

The automated dispensing machine software is capable of tracking inventory and checking expiration dates. Real-time inventory is maintained as the machine subtracts each removal and adjusts the inventory list accordingly. Par levels for each item have been determined. When an item reaches a certain percentage of the par level, a replenishment report is generated at the central pharmacy. The central pharmacy then prepares the supplies and mails them to the clinic. Outages are a rarity. Clinic personnel are further relieved of administrative duties by the lot number and expiration date tracking available in the software. In the event of a drug recall, lot numbers are traceable to the clinic or back to the individual patient for appropriate action. Central pharmacy staff regularly reviews expiration date reports. Items that would be expiring within three months are identified and sent back to the central pharmacy where the higher volume use prevents wastage. Medications not available in the dispensing machine are prepared by the central pharmacy and sent to the patient or clinic via the US Postal Service.

RESULTS

Outcomes data collected include workload statistics such as the total number of prescriptions at each site and the number of prescriptions for Native and non-Native persons, and the number of pharmacist consultations and clinical interventions. During fiscal year 2006 (October 2005 through September 2006), 22665 prescriptions were processed utilizing telepharmacy equipment and prospective pharmacist review. Twenty-five percent (5668) of total prescriptions were issued to non-Native

patients. There were 990 documented pharmacist consultations and interventions (4.4% of all prescriptions processed). Table III shows the reasons for the consultations and interventions. With the pharmacist's oversight of drug inventory, wastage due to overstock and expired medications resulted in a cost avoidance of approximately 2,000 US dollars per month.

Table III. Telepharmacy program pharmacist interventions from October 2005 to September 2006.

Reason for Intervention	Number
Drug therapy recommendations	158
Dose adjustment	150
Incomplete orders	141
Allergies	117
Monitoring	95
Drug interactions	73
Clarification	60
Non-formulary medication	41
Patient identification	40
Prescriptive authority	30
Weight needed	24
Drug changed	19
Drug duplication	18
Contraindications	16
Other categories	8

DISCUSSION

The Southcentral Foundation Telepharmacy Program allowed a pharmacist to be involved in the provision of pharmaceutical services to remote populations to better ensure safe and effective medication use. As an added benefit to participating remote communities, an innovative project provided discounted prescription medications for non-Native people at approved rural clinic sites through an Alternative Methods Demonstration Project funded by the U.S. Health Resources and Services Administration.

Although using telepharmacy to cross distances between facilities and rural populations may be applicable to other areas across the United States serving remote populations, telepharmacy provides additional applications as well. Hospital pharmacies are typically closed during the night, and medications are retrieved by a nurse from a dispensing machine, night cabinet, or the central pharmacy. While this practice is common, the risk of adverse drug events is a concern. The Joint Commission on Accreditation of Health Care Organizations called for first-dose orders to be reviewed by a pharmacist prior to medication administration to prevent untoward effects of the medication. Telepharmacy services are being employed to provide clinical and distributive functions through a combination of contract clinical services and telepharmacy equipment (2). U.S. Public Health Service pharmacists are deployed to provide health care needs in response to natural or manmade disasters such as hurricane relief. As communities prepare disaster plans, mobile telepharmacy models have been discussed as a method for providing pharmaceutical needs in dangerous situations while minimizing risk to personnel. Academic training programs are exploring telepharmacy practice inclusion as a component of their curriculum. The continuum of medical care may be extended to the most remote locations of the world using available telecommunication equipment.

The pharmacy profession continues to be forward-thinking and incorporate available technology to perform the clinical functions

associated with optimizing each patient's pharmaceutical care plan. The American Society of Health-System Pharmacists' Leadership Agenda 2001-2002 highlighted the importance of telemedicine and telepharmacy in the future of the profession (2). The use of innovative technologies to enhance provision of quality pharmacy care in geographically isolated locations with shortages of health care providers is encouraged. The Southcentral Foundation Telepharmacy Program demonstrated success in improving pharmacy services to its significant remote population and is slated for expansion to several additional clinic sites in an effort to expand the role of the pharmacist's clinical expertise in improving medication use safety and medication accountability remotely.

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